

U.S. Application No.: 09/979,564  
AMENDMENT C

Attorney Docket: 3926.033

**REMARKS**

The pending claims are 11-20.

Applicant is pleased to see that claims 12-15 and 19 are indicated as being allowable pending correction of minor formalities.

The claims have been corrected in the manner recommended by the Examiner. Applicant submits that, in view of the above amendments, these claims are now in condition for allowance.

Applicant further submits that the remaining claims are allowable for reasons set forth below.

**Office Action**

Turning now to the Office Action in greater detail, the paragraphing of the Examiner is adopted.

**Paragraphs 2-3 (Claim Rejections - Formalities)**

The correction and allowability of claims 12-15 and 19 is discussed above.

**Paragraphs 4-7 (Claim Rejection - Anticipation)**

Claims 11, 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 4,359,742 to Smith. According to the Examiner, Smith discloses a dual switch multimode array antenna wherein multiple beam patterns are electronically switched to provide various sum and difference patterns.

Applicants respectfully traverse.

To anticipate a claim, a reference must teach every limitation of a rejected claim. Applicant asserts that the cited references do not teach the present invention.

The present invention addresses the problem of increasing demand for sector-wide coverage of large angle areas. Current systems make use of separate individual antennas serving respective sectors. Antenna characteristic is not switchable.

The present invention overcomes this problem using antenna arrays to sector-wise cover a large angle area with high frequency elements and antenna elements.

According to the claims, as amended (replacing "or" with "and"), individual antennas are connected via one or more phase-shifters and one or more hybrid junctions wherein each individual antenna array includes a sum input for selecting the individual antennas so that the antenna mean radiation pattern or directional characteristic exhibits a sum diagram and the antenna array also includes a differential input for selecting the individual antennas so that the antenna mean radiation pattern or directional characteristic exhibits a differential diagram. The antenna elements are driven and can be selected to be either in-phase or in phase-opposition relative to each other.

The antenna mean radiation pattern or directional characteristic exhibits further differential diagrams by the resulting change of the phase behavior due the selection of the individual antennas, or in that the phase shifter and hybrid junctions of the network are switched, such that the antenna

U.S. Application No.: 09/979,564  
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Attorney Docket: 3926.033

mean radiation pattern or directional characteristic exhibits further differential diagrams due to the resulting change of the phase behavior upon the selection of the individual antennas. Antenna elements are driven such that the individual elements are individually operable and can be selected to be either in-phase or in phase-opposition relative to each other.

Present claim 11 is thus directed to an antenna array comprising individual antennas connected via phase-shifters and hybrid junctions for increasing the directional resolution and angular coverage.

Smith teaches a dual switch array antenna comprising, in its preferred embodiment, two waveguide switches and two waveguide phase shifters (see, e.g., col. 2, lines 26-49). Sum (82) and difference (72) ports are provided.

However, Smith does not teach a hybrid array.

The above-mentioned features are neither present in, nor obvious over, the cited references, taken alone or in combination.

Accordingly, withdrawal of the rejections under 35 U.S.C. § 102 is respectfully requested.

U.S. Application No.: 09/979,564  
AMENDMENT C

Attorney Docket: 3926.033

Next, Claims 11, 17 and 18 are again rejected under 35 U.S.C. 102(e) as being allegedly anticipated by US Patent 6,266,010 (Ammar, et al.).

The Examiner refers to his reasoning set forth in the previous two Office Actions, in which he cites Ammar as teaching a beam former having switches for electronically switching among at least one sum beam and one difference beam.

In response, Applicants point out that Ammar teaches only a single summing input, together with a plurality of inputs, each of which is used to operate one of switches S1-S9 to select individual antennas. In contrast, the present invention provides a single differential input that is used to select among a plurality of individual antennas.

For the same reasons that the claim amendments distinguish over Smith, Applicants submit that the amendment of the claims to require the presence of one or more hybrid arrays, in accord with the embodiments of Figs. 2 and 3, also overcomes the rejection over Ammar.

Withdrawal of the rejection is respectfully requested.

**Paragraphs 8-9 (Claim Rejection - 35 USC §103)**

Claims 16 and 20 are rejected under 35 U.S.C. 103(a) as being obvious over any one of Ammar or Smith in view of either Masak et al. or Pierrot (both previously of record).

Applicants respectfully submit that these claims depend from allowable claims, thus are themselves allowable.

Further, claims 16 and 20 represent a preferred embodiment of the invention, wherein by addition of one further antenna it becomes possible to determine the direction of reception of a

U.S. Application No.: 09/979,564  
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Attorney Docket: 3926.033

signal.

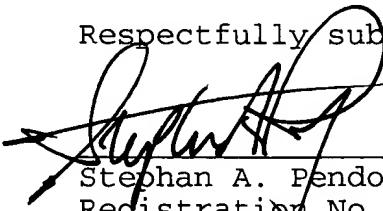
Applicant notes that neither Masak nor Pierrot teaches a hybrid junction and therefore do not remedy the deficiency of Ammar and Smith. Therefore, the claims as amended herein cannot be rendered obvious by any combination of the cited art because not all of the elements are taught, as required.

In addition, Applicant asserts that the required reasonable expectation of success in combining the references has not been provided, and therefore a *prima facie* case of obviousness has not been established, because the secondary references teach cancellation of undesired side-lobes rather than the use of side-lobe suppression to establish reception direction.

Accordingly, withdrawal of the rejection is respectfully requested.

As there are no remaining rejections or objections, Applicant respectfully requests that a timely Notice of Allowance be issued in this case. If the Examiner considers that there are any remaining issues that may be addressed by telephone, the Examiner is requested to contact the undersigned at the number below.

Respectfully submitted,

  
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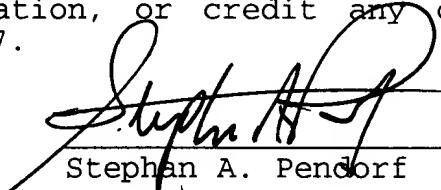
U.S. Application No.: 09/979,564  
AMENDMENT C

Attorney Docket: 3926.033

**CERTIFICATE OF MAILING AND AUTHORIZATION TO CHARGE**

I hereby certify that the foregoing AMENDMENT C for U.S. Application No. 09/979,564 filed November 14, 2001, were deposited in first class U.S. mail, postage prepaid, **Mail Stop: Amendments**, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on **November 16, 2004**.

The Commissioner is hereby authorized to charge any additional fees which may be required at any time during the prosecution of this application, except for the issue fee, without specific authorization, or credit any overpayment, to Deposit Account No. 16-0877.

  
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Stephan A. Pendorf